

Materials and Methods: The inclusion criteria for this multi-center prospective study are (1) biopsy-proven NPC, (2) no distant metastasis, (3) in clinical remission after curative treatment (radiotherapy \pm chemotherapy), (4) within 3 year after finishing radiotherapy. pEBV DNA concentration is monitored every 3 months. Detailed staging workups are performed when abnormal pEBV DNA detected. All tumor recurrences are documented by imaging studies along with pathological verification if the lesions are accessible and patients agree.

Results: From August 2011 to October 2012, 252 patients were enrolled and 33 patients had abnormal pEBV DNA during follow-up visit. Thirty of 33 (91%) patients with elevated pEBV DNA have been proven as tumor relapse, whereas the remaining 219 patients with normal pEBV DNA level are showing no evidence of disease ($P < 0.0001$). In addition, two-thirds (20/30) relapsed patients were detected in a symptomless state.

Conclusions: pEBV DNA assay is a very encouraging tool in monitoring NPC patients after treatment.

PD-0092

The dose to the larynx elevation and tongue retraction muscles has a large impact on post- radiation dysphagia.

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Purpose/Objective: Recent studies showed that the dose distribution in certain anatomical structures, such as the pharyngeal constrictor muscles (PCM), are associated with the risk of radiation-induced dysphagia. In the normal swallowing process, larynx elevation and tongue retraction also play an important role. However, so far, less attention has been paid to the relationship between the dose distribution in muscles involved in larynx elevation and tongue retraction and the risk of radiation-induced dysphagia. Therefore, the purpose of the current study was to investigate the role of the radiation dose delivered to the larynx elevation and tongue retraction muscles in the development of radiation-induced dysphagia.

Materials and Methods: This prospective cohort study included 56 head and neck cancer patients, treated with primary (chemo) radiotherapy (CH)RT. In addition to the anatomical structures that have been previously identified as swallowing organs at risk (SWOARs), such as the PCM superior or supraglottic larynx, muscles involved in larynx elevation and tongue retraction were delineated on planning-CT's. The larynx elevation complex included an anterior complex, including the suprahyoid muscles and thyrohyoid muscle, pharyngeal longitudinal muscles and the posterior digastric/ stylohyoid muscles. The tongue retraction complex included the genioglossus muscle and the tongue base. The primary endpoint was RTOG grade 2-4 dysphagia and the secondary endpoints were patient-rated moderate-to-severe swallowing problems assessed with the EORTC QLQ-H&N35 questionnaire, all at 6 months after completing RT of CHRT.

Results: In the univariate analysis, the mean doses delivered to anterior complex (OR=1.116 (95%CI 1.005-1.238)) and longitudinal muscles (OR=1.043 (95%CI 1.003-1.085)) were significantly ($p \leq 0.05$) associated with the primary endpoint. The doses to the anterior complex (OR=1.080 (95%CI 1.004-1.162)) and the longitudinal muscles were also associated with the risk of moderate-to-severe problems with swallowing SOLID food (OR=1.047 (95%CI 1.006-1.089)). The mean doses delivered to the genioglossus muscle (OR=1.065 (95%CI 1.002-1.132)) and the base of tongue (OR=1.070 (95%CI 1.005-1.140)) were also significantly associated with the primary endpoint. A significant association was found between the mean dose to the genioglossus muscle and problems with swallowing SOLID food (OR=1.055 (95%CI 1.002-1.110)).

Figure 1 shows the NTCP-curves of the risk of grade 2-4 RTOG dysphagia and moderate-to-severe problems with solid food as a function of the mean dose to these structures.

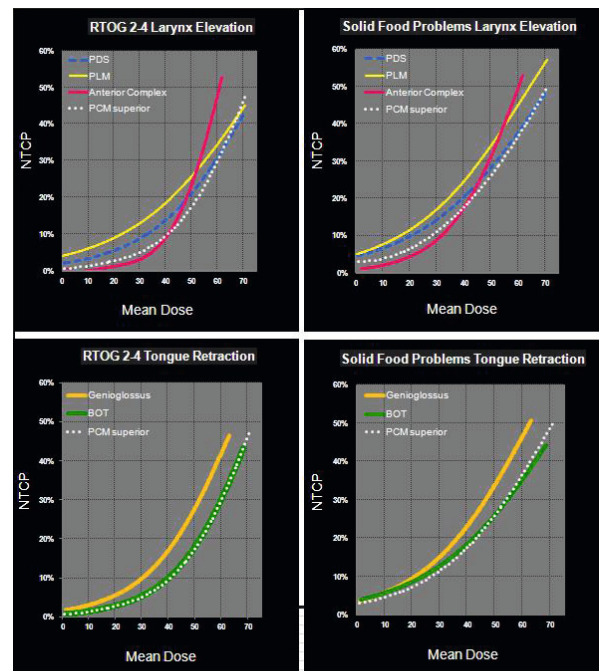


Fig.1. Normal tissue complication probability curves for primary and secondary endpoints. Abbreviations: NTCP= normal tissue complication probability, PCM= pharyngeal constrictor muscle, PDS= posterior digastric/ stylohyoid muscles, PLM= pharyngeal longitudinal muscles, Anterior Complex= suprahyoid muscles and thyrohyoid muscle, Genioglossus= genioglossus muscle, BOT= base of the tongue.

Conclusions: The mean doses delivered to muscles involved in the larynx elevation and tongue retraction, as well as the dose to the superior PCM and supraglottic larynx, are significantly associated with a higher risk of different aspects of radiation-induced dysphagia and these structures should also be considered as Swallowing Organs At Risk.

PD-0093

CT-based tumour volume as a predictor of outcome in laryngeal cancer: results of the phase 3 ARCON trial.

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Purpose/Objective: A wealth of retrospective studies indicate that larger tumour volume is a strong prognostic indicator for poor local tumour control after (chemo)radiotherapy for laryngeal cancer. The impact of tumour volume on the outcome of patients treated within a prospective study comparing accelerated radiotherapy (AR) \pm carbogen breathing and nicotinamide (ARCON) was investigated.

Materials and Methods: Of 345 patients with cT2-4 laryngeal cancer, pre-treatment CT-scans of 270 patients were available for tumour volume calculation. Contouring of the primary tumour and involved lymph nodes was reviewed by a single head and neck radiation oncologist. All living patients had clinical follow-up for a minimum of 2 years after completion of the treatment. Cox proportional hazard models were used for analysis of outcome.

Results: Of 137 AR and 133 ARCON patients, 57 and 80 vs. 56 and 77 patients had glottic and supraglottic tumours, respectively ($P=0.50$). Primary tumour and total lymph node volumes were well balanced between both treatment arms ($P=0.79$ and $P=0.80$, respectively).

A correlation between the primary tumour volume and T-stage was observed ($R_s=0.51$, $P<0.01$). In both treatment arms no correlation was detected between the primary tumour volume or T-stage and